10/561048

Grant

12/14/05

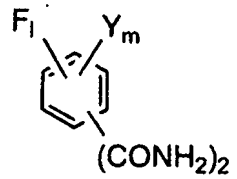
PCT 6/21/04 for 6/23/03

Amendments to the Claims:

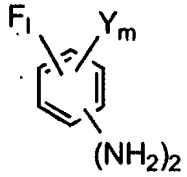
This listing of claims replaces all prior versions and listings of claims in the application:

Listing of Claims:

1. (Original) A method for the production of a fluorinated phenylenediamine represented by the following formula (2), which comprises steps of reacting a diamide represented by the following formula (1) with NaOX [wherein X stands for a bromine atom (Br) or a chlorine atom (Cl)] at a molar ratio of the NaOX to the diamide (NaOX/diamide ratio) in the range of 2.0 - 6.0 and NaOH at a molar ratio of the NaOH to the diamide (NaOH/diamide ratio) in the range of 1.8 - 6.0.



(1)



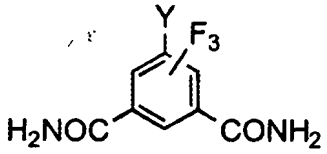
(2)

wherein in the formulas (1) and (2), Y stands for a hydrogen atom (H), a bromine atom (Br), a chlorine atom (Cl), a fluorine atom (F), a C_1 - C_5 alkyl group optionally having a substituent, or a C_1 - C_5 alkoxyl group optionally having a substituent, l is an integer in the range of 1 - 4, m is an integer in the range of 0 - 3, provided that the total number of l and m (l + m) is 4.

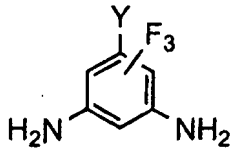
2. (Original) A method according to claim 1, wherein said diamide is reacted with NaOX and NaOH at a temperature in the range of 0 - 20°C and the resultant reaction product is heated at a temperature exceeding 20°C and not exceeding 100°C.

F.PR(t)
PCT

3. (Currently Amended) A method according to claim 1[[or 2]], wherein said diamide is a diamide represented by the following formula (4) and said phenylenediamine is a phenylenediamine represented by the following formula (5).



(4)

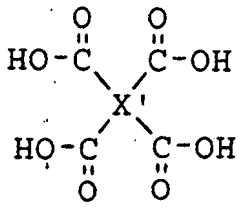


(5)

wherein in the formulas (4) and (5), Y stands for a hydrogen atom (H), a bromine atom (Br), a chlorine atom (Cl), a fluorine atom (F), a C_1 - C_5 alkyl group optionally having a substituent, or a C_1 - C_5 alkoxyl group optionally having a substituent.

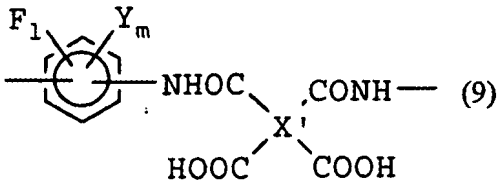
4. (Currently Amended) A method according to ~~any one of claims 1 – 3~~ claim 1, wherein the molar absorption coefficient of the fluorinated phenylenediamine represented by the formula (2) at a wavelength of 450 nm is not more than 2.5 (l/mol·cm).

5. (Currently Amended) A method for the production of a polyamic acid represented by the formula (9), which comprises reacting the fluorinated phenylenediamine produced by the method set forth in claim 1[[or 2]] with tetracaraboxylic acid represented by the formula (8), the acid anhydride or acid chloride thereof, or the ester thereof in an organic solvent.



(8)

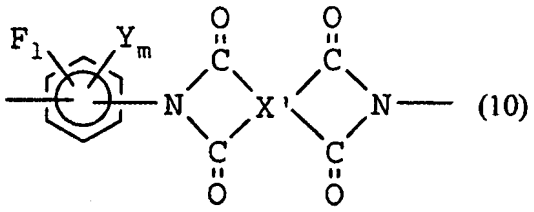
wherein X' stands for a tetravalent organic group,



(9)

wherein Y stands for a hydrogen atom (H), a bromine atom (Br), a chlorine atom (Cl), a fluorine atom (F), a C_1 - C_5 alkyl group optionally having a substituent, or a C_1 - C_5 alkoxyl group optionally having a substituent, l is an integer in the range of 1 - 4, m is an integer in the range of 0 - 3, provided that the total number of l and m (l + m) is 4, and X' stands for a tetravalent organic group.

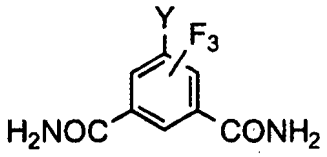
6. (Original) A method for the production of polyimide represented by the formula (10), which comprises cyclizing by heating the polyamic acid produced by the method set forth in claim 5:



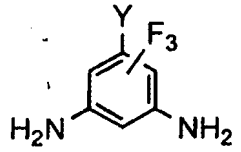
(10)

wherein Y stands for a hydrogen atom (H), a bromine atom (Br), a chlorine atom (Cl), a fluorine atom (F), a C_1 - C_5 alkyl group optionally having a substituent, or a C_1 - C_5 alkoxyl group optionally having a substituent, l is an integer in the range of 1 - 4, m is an integer in the range of 0 - 3, provided that the total number of l and m (l + m) is 4, and X' stands for a tetravalent organic group.

7. (New) A method according to claim 2, wherein said diamide is a diamide represented by the following formula (4) and said phenylenediamine is a phenylenediamine represented by the following formula (5).



(4)



(5)

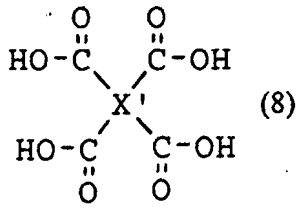
wherein in the formulas (4) and (5), Y stands for a hydrogen atom (H), a bromine atom (Br), a chlorine atom (Cl), a fluorine atom (F), a C_1 - C_5 alkyl group optionally having a substituent, or a C_1 - C_5 alkoxyl group optionally having a substituent.

8. (New) A method according to claim 2, wherein the molar absorption coefficient of the fluorinated phenylenediamine represented by the formula (2) at a wavelength of 450 nm is not more than 2.5 (l/mol·cm).

9. (New) A method according to claim 3, wherein the molar absorption coefficient of the fluorinated phenylenediamine represented by the formula (2) at a wavelength of 450 nm is not more than 2.5 (l/mol·cm).

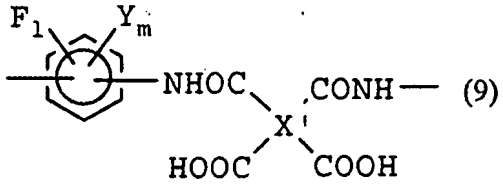
10. (New) A method according to claim 7, wherein the molar absorption coefficient of the fluorinated phenylenediamine represented by the formula (2) at a wavelength of 450 nm is not more than 2.5 (l/mol·cm).

11. (New) A method for the production of a polyamic acid represented by the formula (9), which comprises reacting the fluorinated phenylenediamine produced by the method set forth in claim 2 with tetracaraboxylic acid represented by the formula (8), the acid anhydride or acid chloride thereof, or the ester thereof in an organic solvent.



(8)

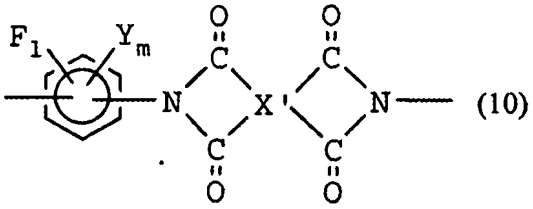
wherein X' stands for a tetravalent organic group,



(9)

wherein Y stands for a hydrogen atom (H), a bromine atom (Br), a chlorine atom (Cl), a fluorine atom (F), a C_1 - C_5 alkyl group optionally having a substituent, or a C_1 - C_5 alkoxyl group optionally having a substituent, l is an integer in the range of 1 - 4, m is an integer in the range of 0 - 3, provided that the total number of l and m (l + m) is 4, and X' stands for a tetravalent organic group.

12. (New) A method for the production of polyimide represented by the formula (10), which comprises cyclizing by heating the polyamic acid produced by the method set forth in claim 11:



(10)

wherein Y stands for a hydrogen atom (H), a bromine atom (Br), a chlorine atom (Cl), a fluorine atom (F), a C_1 - C_5 alkyl group optionally having a substituent, or a C_1 - C_5 alkoxyl group optionally having a substituent, l is an integer in the range of 1 - 4, m is an integer in the range of 0 - 3, provided that the total number of l and m (l + m) is 4, and X' stands for a tetravalent organic group.